The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

Thomas S. Burack, Commissioner

January 29, 2008

The Honorable Martha Fuller Clark, Chairman
Energy, Environment and Economic Development Committee
Legislative Office Building, Room 102
Concord, New Hampshire 03301

Re: SB 48, relative to preventing contamination of groundwater from certain geothermal processes

Dear Chairman Fuller Clark:

Thank you for the opportunity to comment on SB 48, which would allow the Department of Environmental Services (Department) to develop rules that regulate certain heat exchange fluids and installation practices for geothermal systems installed in the State. The Department of Environmental Services (Department) supports this bill.

A geothermal heating and cooling system (also called geo-exchange or ground-source heat pump system) is one that uses heat stored in the ground to heat or cool a home or building. These systems work by circulating a fluid through a well or a trench in the ground and "capturing" the heat of the shallow earth. The fluid then transfers the heat into a structure where it is distributed and used to heat the structure in the winter or cool it in the summer. There are essentially two types of geothermal systems used in the state: one circulates heated or cooled groundwater through an open water well to exchange heat with the ground (so called 'open loop' system); the other circulates an antifreeze solution or refrigerant through a 'closed loop' of piping installed in the ground, below the groundwater table or within a surface water body. Under existing statutes RSA 485:3X and RSA 485-A:13, the Department requires registration of 'open loop' geothermal systems with the Underground Injection Control (UIC) program because these wells meet the definition of a Class V UIC injection well under the federal UIC program.

The greatest advantage of geothermal heating/cooling systems is the fact that by concentrating heat that is naturally present in the shallow earth, rather than producing heat through the combustion of fossil fuels, these systems greatly reduce greenhouse gas and other air emissions, which may significantly impact the environment. Certain types of 'closed loop' geothermal systems, however, may present a threat to groundwater and drinking water quality in that some available heat exchange fluids (antifreeze solutions or refrigerants) are regulated contaminants in New Hampshire. In the event that a leak of heat exchange fluid occurs, it would endanger the quality of the underground source of drinking water or surface water in which it is installed. SB 48 would address this issue by regulating the types of heat exchange fluids that are allowed for use in closed loop geothermal systems, and establishing some basic operational procedure that would reduce the likelihood of a leak from occurring.

In addition, certain types of geothermal systems that circulate deep groundwater through a water well as part of their operation present a unique risk to the public health if installed in an area where groundwater is influenced by brackish or salt water. The risk posed by these systems is the fact that they may introduce deeper salt water to more shallow freshwater aquifer(s) that provide potable drinking water. In areas affected by this phenomenon, other alternative types of geothermal systems, if installed, would not pose the same health concern. SB 48 would address this issue by limiting the types of geothermal systems that are allowed to be installed in these areas or when saline groundwater is observed in the subsurface.

Again, thank you for this opportunity to comment on this bill. Please feel free to call me at 271-2958, or Sarah Pillsbury at 271-1168, if you have any questions or need additional information.

Very truly yours,

Thomas S. Burack
Commissioner

cc: Senator Cilley
Senator Merrill
Senator Odell
Senator Janeway
Representative Keans
Representative Moody
Representative Perry
Representative Price